PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
Eikoh Patent Office
28th Floor, ARK Mori Building
Attn. Oguri, Shohei
12-32, Akasaka 1-Chome,
Minato-Ku
TOKYO 107-6028
JAPAN

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference P-37323	Date of mailing *(day/month/year)* 22/10/2001
	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/JP 01/02893	International filing date *(day/month/year)* 03/04/2001
Applicant MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.	

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Federico Bonomelli

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the International application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped),whether

(i) the claim is unchanged;

(ii) the claim is cancelled;

(iii) the claim is new;

(iv) the claim replaces one or more claims as filed;

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international appplication is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
P-37323		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/JP 01/02893	03/04/2001	04/04/2000
Applicant		
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2B

   [X] as suggested by the applicant.

   [ ] None of the figures.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International Application No
P[redacted] JP 01/02893

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H05K7/14 H04M1/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H05K H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 75 26 707 U (SIEMENS AG) 11 December 1975 (1975-12-11)	1-4
A	the whole document	5

A	US 5 144 533 A (ANNETT THOMAS A) 1 September 1992 (1992-09-01) the whole document	1

A	US 5 229 923 A (LONG CHRISTOPHER R ET AL) 20 July 1993 (1993-07-20) the whole document	1

A	US 4 821 149 A (BELANGER JR THOMAS D) 11 April 1989 (1989-04-11) the whole document	1

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

'&' document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 October 2001	22/10/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Toussaint, F

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
JP 01/02893

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 05, 31 May 1996 (1996-05-31) & JP 08 008554 A (SONY CORP), 12 January 1996 (1996-01-12) abstract	1

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
JP 01/02893

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
DE 7526707	U	11-12-1975	NONE		
US 5144533	A	01-09-1992	CA	2070766 A1	28-12-1992
US 5229923	A	20-07-1993	NONE		
US 4821149	A	11-04-1989	NONE		
JP 08008554	A	12-01-1996	JP	2663917 B2	15-10-1997

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

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11 October 2001 (11.10.2001)

PCT

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WO 01/76339 A2

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(25) Filing Language: English

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(30) Priority Data:
2000-102564 4 April 2000 (04.04.2000) JP

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(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **KUCHIISHI, Koji** [JP/JP]; 729-205, Shinmarukocho, Nakahara-ku, Kawasaki-shi, Kanagawa 211-0005 (JP). **HIGUCHI, Toshihiro** [JP/JP]; 1-102, 1-14, Sugeshiroshita, Tama-ku, Kawasaki-shi, Kanagawa 214-0007 (JP). **HAGA, Hideo** [JP/JP]; A304, 170-1, Kamihoshikawacho, Hodogaya-ku, Yokohama-shi, Kanagawa 240-0042 (JP). **IKEDA, Yasunobu** [JP/JP]; 6-31-6-406, Rokkakubashi, Kanagawa-ku, Yokohama-shi, Kanagawa 221-0802 (JP).

(74) Agents: **OGURI, Shohei** et al.; Eikoh Patent Office, Ark Mori Building, 28th floor, 12-32, Akasaka 1-chome, Minato-ku, Tokyo 107-6028 (JP).

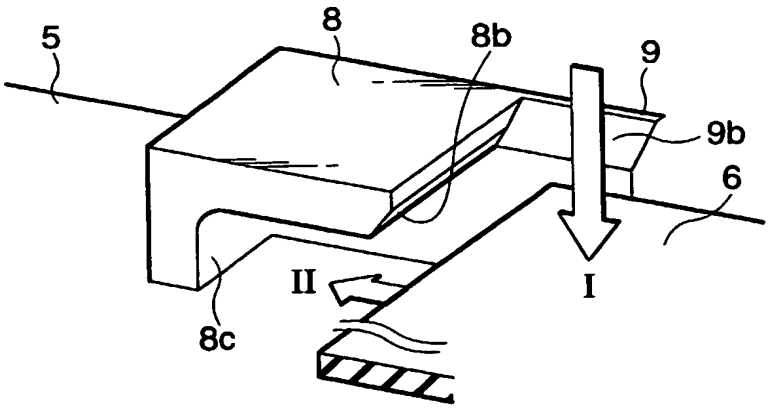
(81) Designated States *(national)*: CN, US.

(84) Designated States *(regional)*: European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PRINTED CIRCUIT BOARD HOLDING STRUCTURE



(57) Abstract: First of all, a sub-PCB (6) is fixedly put on a surface of a chassis (5) as shown in an arrow I. At this time, a taper face (9a) of a guide rib (9) guides a fixed position of the sub-PCB (6) in a transverse direction. Next, the sub-PCB (6) is slid forward as shown in an arrow II. A front end of the sub-PCB (6) is led into a taper face (8b) of a fixed click (8) and is guided downward, and gets into the underside of the click and stops in a position of an abutting face (8c).

WO 01/76339 A2

DESCRIPTION

PRINTED CIRCUIT BOARD HOLDING STRUCTURE

Technical Field

The present invention relates to a printed circuit board holding structure for attaching a printed circuit board (PCB, hereinafter) into a housing, and more particularly to a PCB holding structure capable of reducing a thickness of the housing.

Background Art

Conventionally, there has been a PCB holding structure for attaching a PCB into a housing as shown in Figs. 4 and 5. The PCB holding structure serves to attach a sub-PCB to a chassis provided in a casing of a mobile telephone. Description will be given below with reference to Figs. 4 and 5.

As shown in Fig. 4, the mobile telephone comprises a first casing 21 and a second casing 22. The first casing 21 is provided on the back side and accommodates a chassis 25, a main PCB 24 held on the lower side of the chassis 25, a sub-PCB 26 held on the upper side of the chassis 25, and an LCD module 27 held on the upper side of the chassis 25.

The second casing 22 is provided on the surface side to cover the upper surface of the first casing 21 and has an opening formed in a position opposed to the LCD module 27. A transparent

window 23 is fixed over the opening. In the following description, an upward direction during the use of the mobile telephone is set to a forward direction of the casing.

On both side ends in a place of the chassis 25 where the sub-PCB 26 is to be attached, a pair of movable clicks 28 and 29 are provided in a longitudinal direction with a predetermined space, respectively. In the movable clicks 28 and 29, taper faces formed on upper ends are opposed to taper faces of the movable clicks 28 and 29 provided on opposite side ends. Moreover, the space between the opposed taper faces is set to be slightly smaller than a lateral width of the sub-PCB 26 and elastic deformation can be carried out in such a direction that the space is increased.

When attaching the sub-PCB 26 onto the chassis 25, the taper faces of the movable clicks 28 and 29 are pressed downward from the lower surfaces in both side edge portions of the sub-PCB 26 as shown in Fig. 5A. The movable clicks 28 and 29 are pressed against the sub-PCB 26 and are thereby deformed elastically in such a direction that the lateral space is increased, and are then returned to an original state after the sub-PCB 26 is mounted on the upper surface of the chassis 25. Thus, the sub-PCB 26 can be held by the movable clicks 28 and 29.

In the conventional PCB holding structure described above, the sub-PCB 26 is guided and held through the movable clicks 28 and 29. As shown in Fig. 5B, therefore, it is necessary

to have a holding width a in addition to a guide width b for guiding the sub-PCB 26 to a predetermined board position. In other words, a width of (a + b) is required for the taper face and a height of (d1 + d2) is required for the taper face. As a result, the taper face of the movable click is increased upward. Consequently, there has been a problem in that a vertical thickness of the casing is increased.

In order to solve such a problem, the invention has an object to provide a PCB holding structure capable of reducing a thickness of a casing.

Disclosure of Invention

The present invention provides a PCB holding structure wherein a first guide member having a taper face for guiding a PCB in a transverse direction when fixedly putting the PCB on an attachment object member and a second guide member having a taper face for downward guiding the PCB put fixedly when sliding the PCB in a longitudinal direction are provided on the attachment object member. By such a structure, it is possible to set the heights of the first and second guide members to be smaller than a height of a conventional click. Therefore, it is possible to reduce a thickness of an apparatus casing having the PCB provided therein.

Brief Description of the Drawings

Fig. 1 is a view showing a PCB holding structure according to an embodiment of the invention;

Figs. 2A and 2B are views illustrating the structure of a fixed click and a guide rib in Fig. 1 and the procedure for attaching a sub-PCB;

Figs. 3A and 3B are views showing a variant of the shapes of a chassis and the sub-PCB and the positions where the fixed click, the guide rib and a stopper are to be provided;

Fig. 4 is a view showing a conventional PCB holding structure; and

Figs. 5A and 5B are views illustrating the procedure for attaching a conventional PCB to a chassis.

Best Mode for Carrying Out the Invention

An embodiment of the invention will be described below in detail with reference to the drawings.

Fig. 1 is a view showing a PCB holding structure according to an embodiment of the invention. In the embodiment, there is provided a PCB holding structure in which a sub-PCB is attached to a chassis provided in a casing of a mobile telephone.

As shown in Fig. 1, the mobile telephone comprises a first casing 1 and a second casing 2. The first casing 1 is provided on the back side and accommodates a chassis 5, a main PCB 4 held on the lower side of the chassis 5, a sub-PCB 6 attached onto the chassis 5, and an LCD module 7 held on the upper side

of the chassis 5. The second casing 2 is provided on the surface side to cover the upper surface of the first casing 1 and has an opening formed in a position opposed to the LCD module 7. A transparent window 3 is fixed over the opening.

The chassis 5 and the sub-PCB 6 are formed of a synthetic resin having elasticity. In the chassis 5, a fixed click 8 and a guide rib 9 are provided in the front edge parts of both side edge portions in a place where the sub-PCB 6 is to be attached, and a fixed click 10 and a guide rib 11 are provided in the rear edge parts of the both side edge portions. In the chassis 5, moreover, a stopper 12 is provided in the rear edge part of the place where the sub-PCB 6 is to be attached. Furthermore, a notch 6a for causing the fixed click 10 to penetrate therethrough is formed in the rear portion of the sub-PCB 6.

As shown in Fig. 2A, the fixed click 8 is erected on the side edge part of the surface of the chassis 5 in a sectional shape obtained by rotating an almost L shape by 90 degrees rightwards. There is provided a guide face 8a to be an internal wall surface parallel with a side edge 5a of the chassis 5. Moreover, a taper face 8b to have a distance from the surface of the chassis 5 decreased gradually is formed inwardly from the tip portion of the click. Furthermore, an abutting face 8c which is perpendicular to the surface of the chassis 5 and is orthogonal to the side edge 5a of the chassis 5 is provided in the base portion of the click. Moreover, the guide rib 9

is erected to have an almost prismatic shape in the side edge part of the surface of the chassis 5 as shown in Fig. 2A. A taper face 9b turned toward the inside of the side edge 5a of the chassis 5 is formed on the upper end of the guide rib 9, and furthermore, a vertical guide face 9a reaching the surface of the chassis 5 from the lower end of a taper face 9b is formed. The taper face 9b has a width equivalent to a guide width b and a height equivalent to a height d1 in Fig. 5B. The guide rib 9 is constituted integrally with the fixed click 8, and the guide face 9a and the guide face 8a form continuous surfaces without a step. The fixed click 10 has such a shape that the abutting face 8c is cut away from the fixed click 8. The guide rib 11 has the same shape as that of the guide rib 9. The stopper 12 is a projection provided upward from the rear edge of the chassis 5. The fixed click 8, the guide rib 9, the fixed click 10, the guide rib 11 and the stopper 12 are suitably formed integrally with the chassis 5.

Description will be given to the procedure for attaching the sub-PCB 6 to the chassis 5 having such a structure. First of all, the sub-PCB 6 is fixedly put on the surface of the chassis 5 as shown in an arrow I of Fig. 2B. In such a state that the sub-PCB 6 is fixedly put on the surface of the chassis 5, the side end face of the front edge part of the sub-PCB 6 is in contact with the guide face 9a of the guide rib 9, the rear edge part is mounted on the stopper 12 and the notch 6a is opposed

to the fixed click 10. As shown in an arrow II of Fig. 2B, next, the sub-PCB 6 is slid forward. The front end of the sub-PCB 6 is led into the taper face 8b of the fixed click 8 and is guided downward, and gets into the underside of the click. At the same time, the rear edge part of the sub-PCB 6 is also led into the taper face of the fixed click 10 and is guided downward, and gets into the underside of the click. At this time, both side ends of the front edge part of the sub-PCB 6 is guided by the guide face 9a and the guide face 8a. Then, the front end of the sub-PCB 6 abuts on the abutting face 8c so that a sliding operation is stopped and the attachment of the sub-PCB 6 is completed.

In such a state that the sub-PCB 6 is attached to the surface of the chassis 5, the front end face of the sub-PCB 6 is in contact with the contact face 8c of the fixed click 8 and the side end face thereof is in contact with the guide face 9a of the guide rib 9 and the guide face 8a of the fixed click 8. Moreover, the side end face of the rear edge part of the sub-PCB 6 is in contact with the guide face of the guide rib 11 and that of the fixed click 10, and the rear end face thereof is positioned ahead of the stopper 12. Even if the sub-PCB 6 is to be slid rearward in this state, the rear end of the sub-PCB 6 abuts on the front end of the stopper 12 so that the sliding operation is inhibited. Consequently, the sub-PCB 6 can be prevented from automatically getting out by

gravitation.

When the sub-PCB 6 is to be removed, the stopper 12 is pressed downward and is thus flexed and the sub-PCB 6 is slid rearward while maintaining such a state that the rear end of the sub-PCB 6 does not abut on the front end of the stopper 12, and is then returned to the fixed state. Next, when the sub-PCB 6 is lifted upward, the chassis 5 can be removed.

The guide face 8a of the fixed click 8 does not need to be provided. Moreover, the predetermined positions of both side ends of the sub-PCB 6 may be widened to be positioning portions, and the sliding operation may be completed in a position where the positioning portions abut on the abutting face 9c of the guide rib 9. With such a structure, the contact face 8c does not need to be provided on the fixed click 8. To the contrary, in the case in which the abutting face 8c is provided, the contact face 9c is not required. In other words, either the contact face 8c or 9c may be provided. Furthermore, the guide face 8a may be provided on the outside of the guide face 9a. The fixed click 8 and the guide rib 9 may be provided separately. Moreover, the height of the guide rib 9 may be smaller than that of the fixed click 8. Furthermore, the shapes of the chassis 5 and the sub-PCB 6 and the positions where the fixed clicks 8 and 10, the guide ribs 9 and 11 and the stopper 12 are to be provided may be set as shown in Fig. 3.

According to the embodiment of the invention, as described

above, the ribs 9 and 11 having the taper faces for guiding the sub-PCB 6 in a transverse direction when fixedly putting the sub-PCB 6 on the chassis 5 and the fixed clicks 8 and 10 having the taper faces for downward guiding the sub-PCB 6 put fixedly when forward sliding the sub-PCB 6 are provided in the side edge part of the chassis 5. A height h2 of the fixed clicks 8 and 10 can be made smaller than a height h1 of the conventional movable click. Therefore, it is possible to reduce a thickness of a casing of a mobile telephone.

Industrial Applicability

According to the invention, as described above, it is possible to set the heights of the first and second guide members to be smaller than a height of the conventional movable click. Therefore, it is possible to reduce a thickness of an apparatus casing having the PCB provided therein.

CLAIMS

1. A printed circuit board holding structure for attaching a printed circuit board on an attachment object member, comprising:

a first guide member having a taper face for guiding the printed board circuit in a transverse direction when fixedly putting the printed board circuit on the attachment object member; and

a second guide member having a taper face for downward guiding the printed circuit board put fixedly when sliding the printed circuit board in a longitudinal direction.

2. A printed circuit board holding structure according to claim 1, wherein the second guide member has an abutting face for defining a position where a tip of the printed circuit board is to be stopped.

3. A printed circuit board holding structure according to claim 1, wherein the second guide member has a guide face for defining a position of a side end face of the printed circuit board.

4. A printed circuit board holding structure according to claim 1, further comprising an elastic stopper member for

preventing the printed circuit board from going backward after the sliding is completed.

5. A printed circuit board holding structure according to claim 1, wherein the first guide member and the second guide member are constituted integrally.

FIG. 1

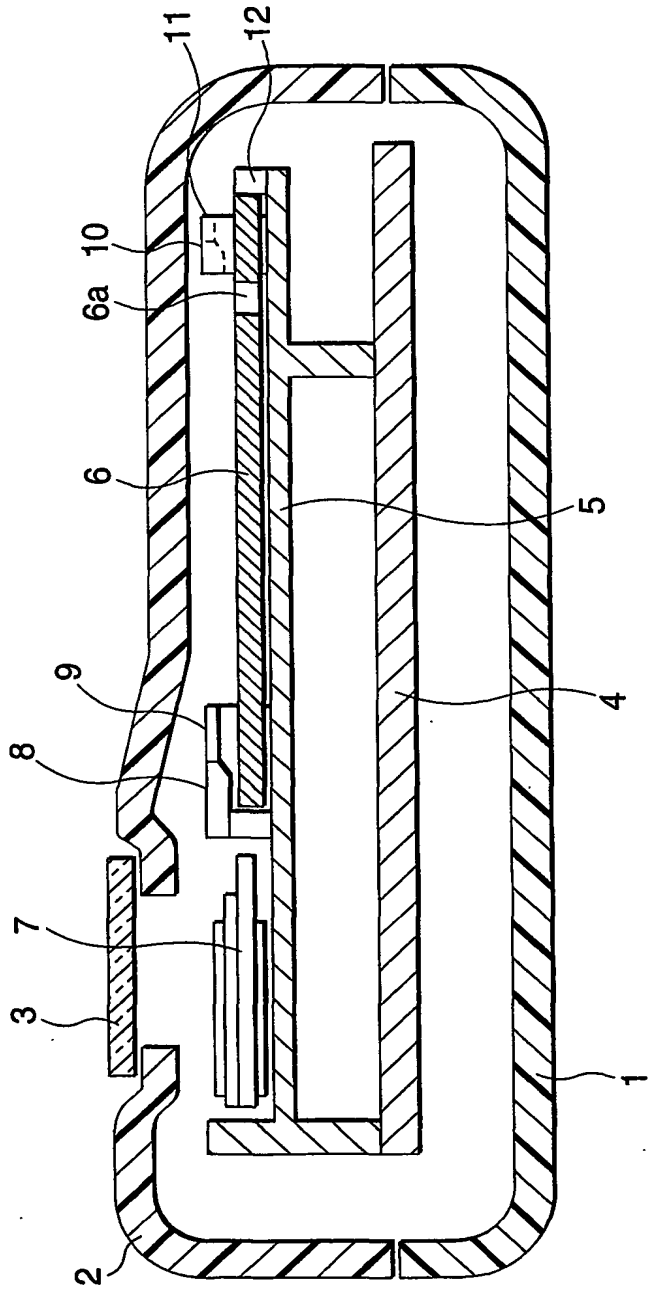


FIG. 2A

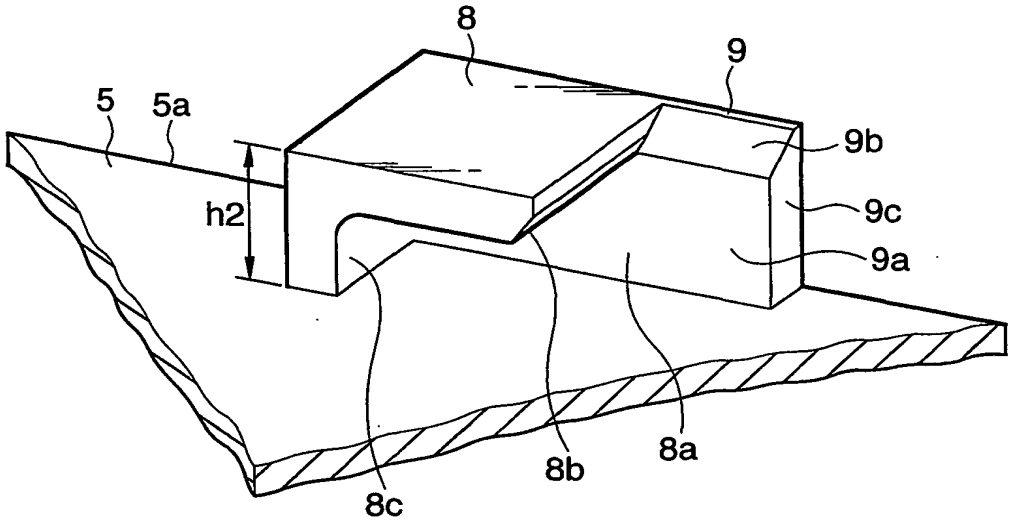


FIG. 2B

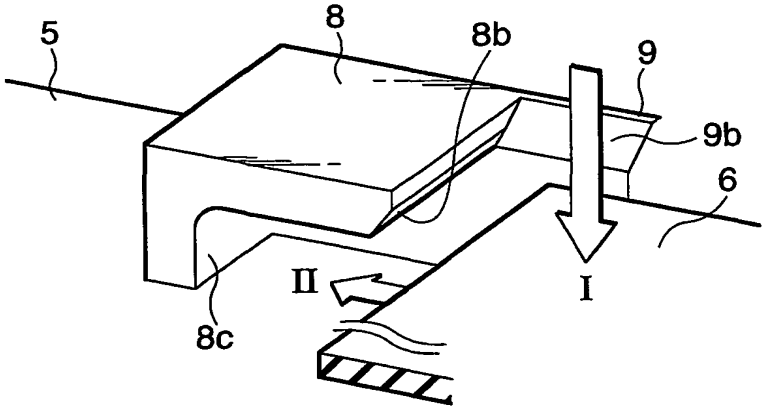


FIG. 3A

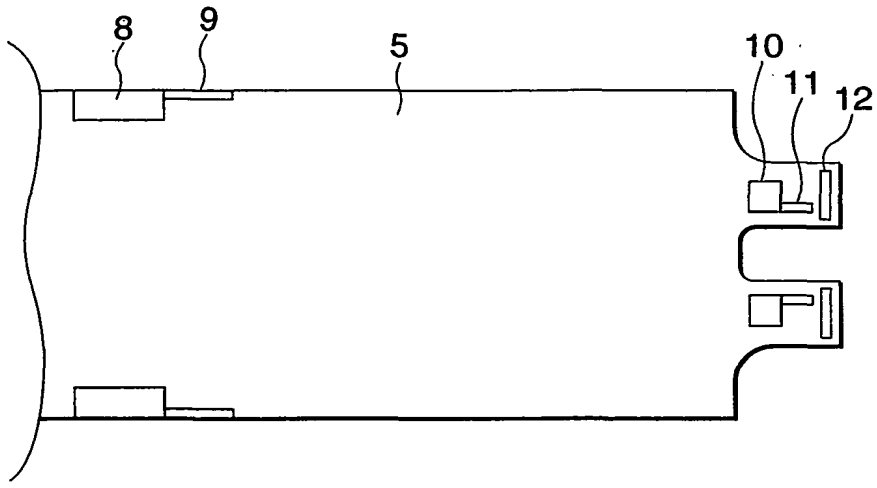


FIG. 3B

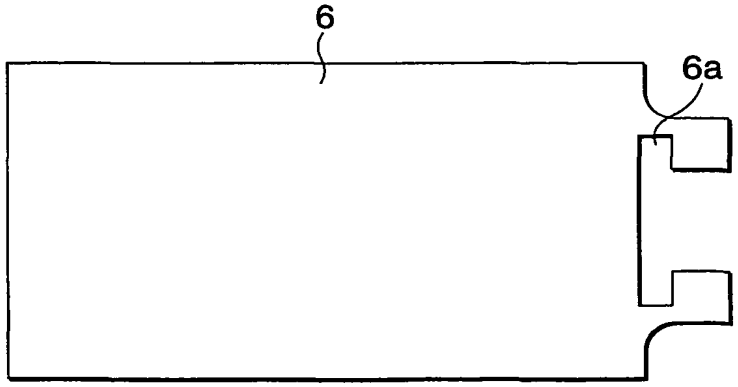


FIG. 4

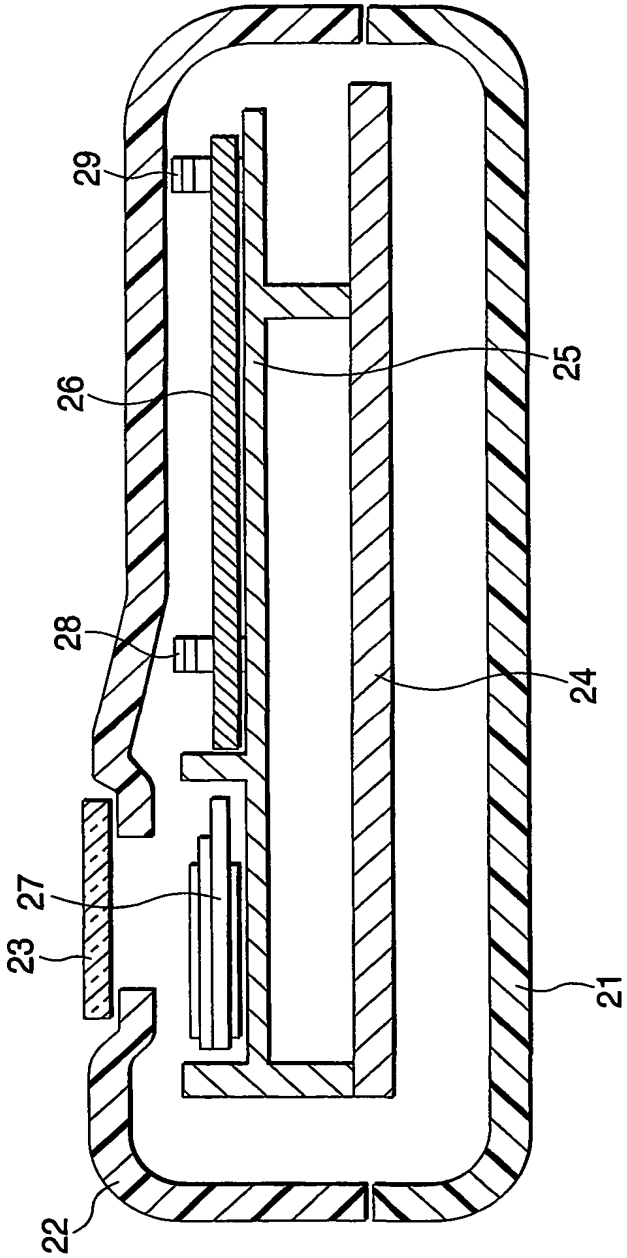


FIG. 5A

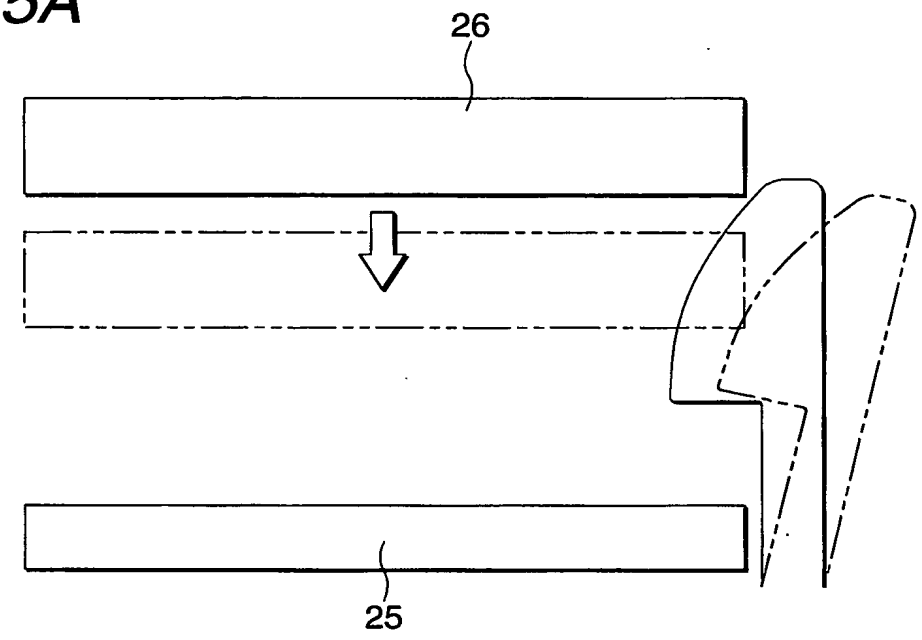
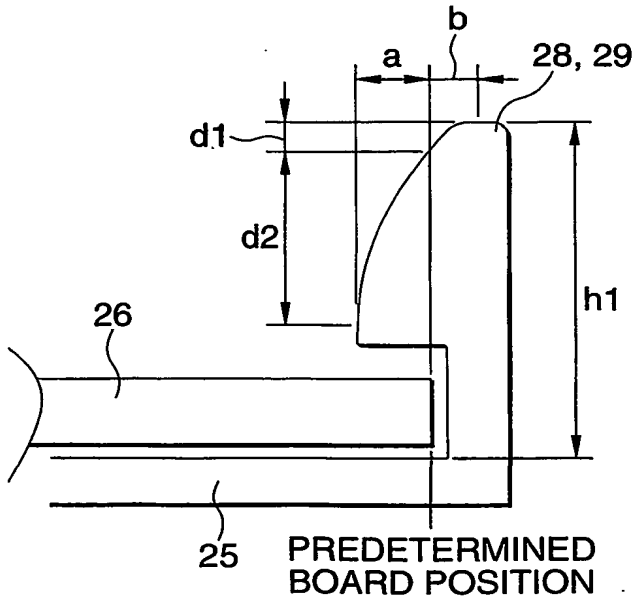


FIG. 5B



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(74) Agents: **OGURI, Shohei** et al.; Eikoh Patent Office, Ark Mori Building, 28th floor, 12-32, Akasaka 1-chome, Minato-ku, Tokyo 107-6028 (JP).

(81) Designated States *(national)*: CN, US.

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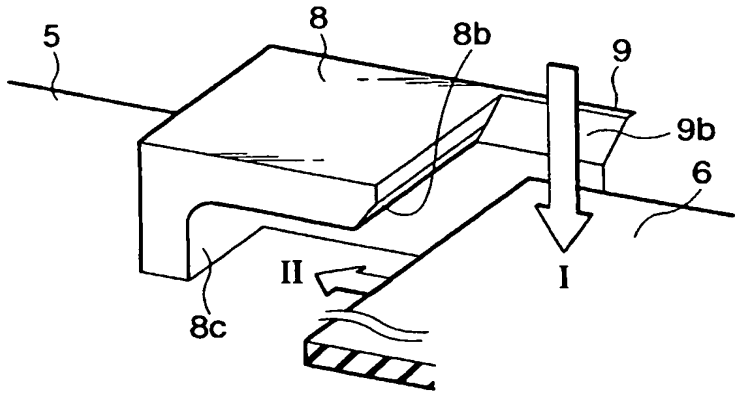

(57) Abstract: First of all, a sub-PCB (6) is fixedly put on a surface of a chassis (5) as shown in an arrow I. At this time, a taper face (9a) of a guide rib (9) guides a fixed position of the sub-PCB (6) in a transverse direction. Next, the sub-PCB (6) is slid forward as shown in an arrow II. A front end of the sub-PCB (6) is led into a taper face (8b) of a fixed click (8) and is guided downward, and gets into the underside of the click and stops in a position of an abutting face (8c).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	the whole document	5

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A	US 4 821 149 A (BELANGER JR THOMAS D) 11 April 1989 (1989-04-11) the whole document	1

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Date of the actual completion of the international search	Date of mailing of the international search report
11 October 2001	22/10/2001

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter. nal Application No
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